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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/575,251

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Piergiorgio Romanin

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NIXON & VANDERHYE, PC
901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

EXAMINER

NGUYEN, HUNG D

ART UNIT

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4118

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/575,251	Applicant(s) ROMANIN ET AL.	
	Examiner HUNG NGUYEN	Art Unit 4118	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 April 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/10/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “seat or throat for receiving the dust material” in claim 7 and 8 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

1. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: "a seat or throat for receiving the dust material" in claims 7 and 8.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1, 3, 4, 6, 9, 12 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 1 recites the limitation "the welding area" in lines 4-5. There is insufficient antecedent basis for this limitation in the claim. It is suggested to amend to —a welding area—or define a welding area earlier in the claim.

5. Claim 1 recites the limitation "the laser welding operation" in lines 5-6. There is insufficient antecedent basis for this limitation in the claim. It is suggested to amend to —a laser welding operation— or define a laser welding operation earlier in the claim.

6. Claim 1 recites the limitation "the weld material" in line 7. There is insufficient antecedent basis for this limitation in the claim. It is suggested to amend to —a weld material— or define a weld material earlier in the claim.

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7. Claim 3 recites the limitation "the grain size" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim. It is suggested to amend to —a grain size— or define a grain size earlier in the claim.

8. Claim 4 recites the limitation "the adduction of the dusts" in line 2. There is insufficient antecedent basis for this limitation in the claim. It is suggested to amend to —an adduction of the dusts— or define an adduction of the dusts earlier in the claim.

9. Claim 4 recites the limitation "the adduction of covering gas" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim. It is suggested to amend to —an adduction of covering gas— or define an adduction of covering gas earlier in the claim.

10. Claim 6 recites the limitation "the angle of adduction of the dusts" in line 2. There is insufficient antecedent basis for this limitation in the claim. It is suggested to amend to —an angle of adduction of the dusts— or define an angle of adduction of the dusts earlier in the claim.

11. Claim 9 recites the limitation "the relative position" in line 2. There is insufficient antecedent basis for this limitation in the claim. It is suggested to amend to —a relative position— or define a relative position earlier in the claim.

12. Claim 9 recites the limitation "the axis of the laser beam" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim. It is suggested to amend to —an axis of the laser beam— or define an axis of the laser beam earlier in the claim.

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13. Claim 9 recites the limitation "the plane of the weld area" in line 3. There is insufficient antecedent basis for this limitation in the claim. It is suggested to amend to —a plane of the weld area— or define a plane of the weld area earlier in the claim.

14. Claim 12 recites the limitation "the distance between the laser spot" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim. It is suggested to amend to —a distance between the laser spots— or define a distance between the laser spots earlier in the claim.

15. Claim 14 recites the limitation "the weld area" in lines 6. There is insufficient antecedent basis for this limitation in the claim. It is suggested to amend to —a weld area— or define a weld area earlier in the claim.

16. Claim 14 recites the limitation "the execution of the weld" in lines 6. There is insufficient antecedent basis for this limitation in the claim. It is suggested to amend to —an execution of the weld— or define an execution of the weld earlier in the claim.

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. Claims 1, 4, 7-10, and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pratt et al. (US Pat. 5,254,155) in view of Takahashi et al. (US Pat. 5,296,677).

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19. Regarding claim 1, Pratt et al. discloses a method for laser welding of a first element 12a (Fig. 3) and a second element 12b (Fig. 3), comprising the step of focusing a laser beam 30 (Fig. 3) in proximity to the welding area 18 (Fig. 3), wherein the laser welding operation is conducted with the addition of a weld material 56 (Fig. 4), characterized in that the weld material is adducted simultaneously to the welding operation and is in form of powder streams 56 (Fig. 4) inherently are metal dust for welding (Col. 4, Line 16-25) except for at least a first material is of sintered material. However, Takahashi et al. teaches a filler metal for welding sintered material joining at least a piece of sintered materials to a piece of steel or two pieces of the same sintered material (Par. 8, Lines 33-34; Par. 14, Lines 39-40). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Pratt et al. to include sintered material to the welding operation for the purpose of assembling of automotive transmission systems (Par. 1, Lines 7-10).

20. Regarding claim 4 and 16, Pratt et al. discloses all the claimed features except for a nozzle for the adduction of the dusts (T) is provided, separate from a nozzle (N) for the adduction of covering gas 5. However, Takahashi et al. teaches a filler metal for welding sintered material with two separate nozzle, a gas shield nozzle 5 (Fig. 1) and filler metal nozzle for filler metal 2 (Fig. 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Pratt et al. to have two nozzles for gas and dust, as taught by Takahashi et al., for the purpose of covering/shielding larger area at the welding spot.

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21. Regarding claim 7, as best understood, Pratt et al. further discloses the laser weld is conducted at a junction area between the first 12a (Fig. 3) and the second element 12b (Fig. 3) and that at the aforesaid junction area is provided a seat 58 (Fig. 3) for receiving the dust material.

22. Regarding claim 8, as best understood, Pratt et al. further discloses the seat is formed in part in the first element 12a (Fig. 3) and in part in the second element 12b (Fig. 3) to be welded.

23. Regarding claim 9, Pratt et al. further discloses the relative position of the axis of the laser beam 30 (Fig. 3) relative to the plane of the weld area 58 (Fig. 3) is chosen according to the materials constituting said first and second element (Col. 2 Lines 53-58 and Col. 5, Lines 2-6). The workpiece is mounted on the multi-axis CNC table 26 (Fig. 2) and the laser focusing head 60 (Fig. 4) are adjustable along axis z, therefore the position of the axis of the laser beam is base on shape or size of the welded material (Col. 2, Lines 1-15).

24. Regarding claim 10, Pratt et al. discloses all the claimed features except for the laser beam (L) is focused to a greater extent on one of said first and second element than on the other. However, Pratt et al. teaches single point powder feed nozzle for use in laser beam where the workpiece 12a and 12b (Fig. 3) mounted on the multi-axis table 26 (Fig. 2), the laser focusing head 60 (Fig. 2) elevated by supporting member 52a (Fig. 2) along z axis for the welding operation (Col. 2 Lines 53-58 and Col. 5, Lines 2-6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Pratt et al. to have a laser beam is focus to a greater

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extend on one of the first element and second element than on the other by adjusting the multi-axis table and the laser focusing head, as taught by Pratt et al., for the purpose of welding a sintered material to a part of the same material or steel in the assembling of automobile transmission systems as mention by Takahashi et al. (Par. 1, Lines 7-10).

25. Regarding claim 14, Pratt et al. discloses a method for laser welding of a first element 12a (Fig. 3) and a second element 12b (Fig. 3), comprising: means for supporting the two elements to be welded 24 (Fig. 2, for supporting a workpiece on the multi-axis computer numerical control table 26), a focusing head 28 (Fig. 2) for focusing a laser beam 30 (Fig. 2) in the weld area, means for imparting a relative motion between a focusing head 28 (Fig. 2) and the elements 12a and 12b (Fig. 3) to be welded, in order to form a weld bead 18 (Fig. 3), and means for supplying a flow of powder stream 56 (Fig. 4) inherently are metal dusts for welding to the weld area 58 (Fig. 3) except for at least a first material is of sintered material. However, Takahashi et al. teaches a filler metal for welding sintered material joining at least a piece of sintered materials to a piece of steel or two pieces of the same sintered material (Par. 8, Lines 33-34; Par. 14, Lines 39-40). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Pratt et al. to include sintered material to the welding operation for the purpose of assembling of automotive transmission systems (Par. 1, Lines 1-4).

26. Regarding claim 15, as best understood, Pratt et al. discloses all the claimed features except for a nozzle (N, T) for supplying the dusts arranged in proximity to the

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weld area in a fixed position relative to the focusing head. However, Takahashi et al. teaches a filler metal for welding sintered material with two separate nozzle, a gas shield nozzle 5 (Fig. 1) and filler metal nozzle for filler metal 2 (Fig. 1) with respect to the laser focusing nozzle 3 (Fig. 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Pratt et al. to have two nozzles for gas and dust, as taught by Takahashi et al., for the purpose of covering/shielding larger area at the welding spot.

27. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pratt et al. (US Pat. 5,254,155) in view of Takahashi et al. (US Pat. 5,296,677) and further view of Naito et al. (JP Pat. 02000-153392).

28. Regarding claim 2, as best understood, the combined references disclose all the claimed features except for the dust used is a mixture of metal dusts. However, Naito et al. teaches the sintering material for cladding by welding using powder consisting of a metal composition of one or more elements (Abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Pratt et al. to include the dust used for welding is a mixtures of metal dusts, as taught by Naito et al, for the purpose of improving productivity and reducing cost.

29. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pratt et al. (US Pat. 5,254,155) in view of Takahashi et al. (US Pat. 5,296,677) and further view of Kawasaki et al. (US Pub. 2004/0045641A1).

30. Regarding claim 3, the combined references disclose all the claimed features except for the grain size of the dusts ranges between 0.010 and 0.100 mm. However,

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Kawasaki et al. teaches wear-resistant copper-base alloy with the powder particle diameter of about 0.005 mm to 0.3 mm (Par. 73, Lines 4-5). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Pratt et al. to include the grain size of the dusts ranges between 0.01 mm to 0.10 mm, as taught by Kawasaki et al., for the purpose of enhancing the crack resistance.

31. Claims 6, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pratt et al. (US Pat. 5,254,155) in view of Takahashi et al. (US Pat. 5,296,677) and further view of Naito et al. (JP Pat. 02000-153380).

32. Regarding claim 6, the combined references disclose all the claimed features except for the angle of adduction of the dusts ranges between 15° and 75° relative to the plane of the weld area (W). However, Naito et al. teaches a method for cladding by laser welding with the sintered body 10 (Fig. 6) at 45° to the workpiece (Par. 38 Lines 5-8). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Pratt et al. to have an angle of adduction of the dust ranges between 15° and 75°, as taught by Naito et al., for the purpose of preventing spatters to the nozzle.

33. Regarding claim 13, the combined references disclose all the claimed features except for a laser source chosen among CO₂, Nd-YAG, High Power Laser Diode is used. However, Naito et al. teaches a method for cladding by laser welding with the transmission of the laser beam used Nd-YAG (Par. 19). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify

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Pratt et al. to include Nd-YAG as the source of laser, as taught by Naito et al., for the purpose of radiating heat to the powder materials.

34. Claims 5 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pratt et al. (US Pat. 5,254,155) in view of Takahashi et al. (US Pat. 5,296,677) and further view of Pyritz et al. (US Pub. 2002/0166846 A1).

35. Regarding claim 5 and 17, the combined references disclose all the claimed features except for the dusts are adducted by means of the nozzle (N) used for supplying covering gas. However, Pyritz et al. teaches the powder feed nozzle for laser welding which nozzle 120 (Fig. 6) used to deliver gas stream 133 (Fig. 6) and powder stream 134 (Fig. 6). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Pratt et al. to have a nozzle can discharge the powder stream and gas stream, as taught by Pyritz et al, for the purpose of preventing spatter to the nozzle which can clog the nozzle.

36. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pratt et al. (US Pat. 5,254,155) in view of Takahashi et al. (US Pat. 5,296,677) and further view of Nagano et al. (US Pub. 2003/0052105).

37. Regarding claim 11, the combined references disclose all the claimed features except for the laser beam is shaped with a non circular section, such as a square or rectangular section. However, Nagano et al. teaches a laser sintering apparatus with a rectangular laser beam 16 (Fig. 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Pratt et al. to have the laser beam is shaped with a non circular section, such as a square or

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rectangular section, as taught by Nagano et al., for the purpose of covering larger area at the welding spot.

38. Regarding claim 12, the combined references disclose all the claimed features except for the laser beam is shaped by means of a dual-focus optical system with variation of the distance between the laser spots produced. However, Nagano et al. teaches a laser sintering apparatus with multiple focus optical systems 30 and 32 (Fig. 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Pratt et al. to have dual-focus optical system, as taught by Nagano et al., for the purpose of selecting various shape of the laser beam.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUNG NGUYEN whose telephone number is (571)270-7828. The examiner can normally be reached on Monday-Friday, 7:30AM-5PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Quang Thanh can be reached on (571)272-4982. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Quang D. Thanh/
Supervisory Patent Examiner, Art
Unit 4118

/HUNG NGUYEN/
Examiner, Art Unit 4118